CHAPTER 2 - COAL BED METHANE OPERATIONAL SUMMARY

CBM has been produced in the Powder River Basin of Montana since April 1999. The first exploration wells were drilled in 1990 in both the Big Horn and Powder River Basins. The bulk of the producing data has, however, less history than that. In the CX field, operated by Fidelity Exploration & Production Company, approximately 20 months of production data have been submitted to the MBOGC. The majority of CBM production is from the D-3 coal at approximately 250 to 300 feet deep. Additional CBM production is achieved from the Monarch coal at a depth of approximately 400 feet and the Carney coal at a depth of approximately 600 feet. In the CX field, these coals maintain sufficient separation that pressure communication is likely not significant. No well is completed in more than one coal (Williams 2001).

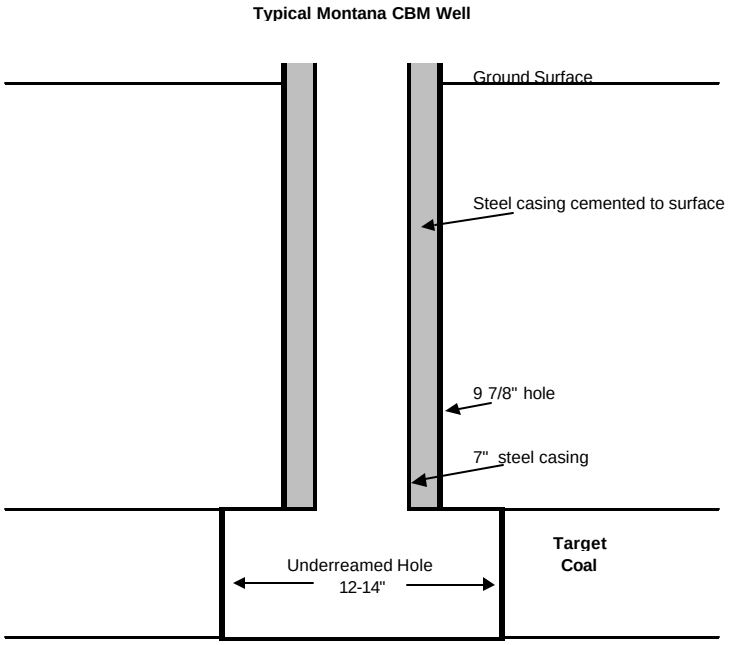
WELL DRILLING AND COMPLETION

The drilling of a CBM well in the Montana portion of the PRB has commonly been done in three distinct stages. First, if necessary to protect vulnerable alluvial aquifers at the surface, a small truck-mounted drilling rig referred to as a Spudder rig is used to start the drilling process and set an appropriate amount of conductor pipe to protect shallow alluvial aquifers. In the Montana PRB, alluvium is usually less than 90 feet thick where present, and most CBM wells in Montana are not completed with this shallow protective casing due to the absence of an alluvial aquifer. Next, a larger drill rig is brought to the well site to facilitate drilling to the top of the target coal seam. Once drilling is completed and the target coal seam is reached, a steel production casing is placed in the well and cemented in-place from the bottom of the drilled hole to the surface using standard oilfield cement. At the CX Ranch Field, three coal seams have being targeted for CBM production and each well has been completed in one of these seams. To date, other coal seams present have either remained undrilled or have been cased off. After the cement used to set the production casing has cured, a third completion rig is often used to drill out the cement plug left at the bottom portion of the drilled hole. This drill rig is also used to drill a pilot-hole to the base of the target coal, and under-ream the coal section. The producing section is left open for production purposes.

Exhibit 5 is a schematic view of a typical CBM well from the CX Ranch. This exhibit shows the more common well completion scenario where conductor casing is not used. Although there are variations in this drilling and completion methodology, the approach is generally common for current practices. However, future practices could vary from this method depending on the depth of targeted coal seams advances in drilling technologies, or changes in drilling philosophies. Potential changes could include, but may not be limited to, completing wells in more than one coal seam or drilling directional or horizontal wells.

To date, drilling has been done with fresh water drilling fluids to protect the aquifers and the coals being drilled. Water supply during the drilling phases is most often from produced water, although ponds can also be utilized. The bore-hole will finally be cleaned with a slug of formation water pumped at a high rate to flush the coalface. The wells are not artificially fractured during completion activity, although this technique may be used in other parts of the PRB or in other areas of Montana where natural fracturing (cleat) may not be developed. An electric submersible pump (ESP) is installed near the base of the coal on the end of fiberglass tubing. To help monitor the water level in the well, a 1/4-inch capillary tube may be installed for data collection purposes.

EXHIBIT 5 - TYPICAL CBM WELL IN THE MONTANA PORTION OF THE PRB
This exhibit diagrams a CBM well as they are typically drilled in the CX Ranch Field. In addition to the elements shown, there may be local variations.



CBM PRODUCTION OPERATIONS

During production, water is pumped up a tubing string to be filtered, metered, and put into a water flow-line for handling or discharge. At the only producing CBM field in the Montana portion of the PRB, the water is either used in drilling new wells, pumped into ponds for use by the land owner, or discharged to the Tongue River through a MDEQ discharge permit. Although many additional water use and disposal methods have been suggested and could be used if CBM development continues to increase, current water handling practices are limited.

Immediately after the well is drilled, the water level stands at some elevation above the level of the coalbed, an expression of the virgin reservoir pressure. At this pressure, methane will not flow into the wellbore (Williams 2001). After initial pumping, the water level is reduced, allowing methane to flow out of the coal seam into the borehole up to the surface. The gas comes up the casing-tubing annulus and runs into a low-pressure (approximately 5 pounds per square inch [psi]) flowline. The natural gas consists of approximately 96 percent methane, 3.5 percent nitrogen, and trace amounts of carbon dioxide (CO_2). The flow-line connects to a metering manifold that knocks out the last of the water and connects to an approximately 400-horsepower (hp) field compressor that increases pressure to approximately 40 psi in a gathering pipeline. The gathering lines are connected to a large sales compressor station that builds pressure to approximately 1,000 psi in the regional sales pipeline. All CX Ranch producing wells are currently equipped with individual totalizing wedge-meters rather than estimated from grouped well rates. When the field began producing, some well production volumes were estimated. Since the field's inception, meters have occasionally become plugged. In those instances, production volumes have been estimated.

Produced water is piped away from the wellsite and managed in several ways. Currently, the majority of the produced water is discharged to the Tongue River under the authorization of a Montana Pollutant Discharge Elimination System (MPDES) permit issued by the MDEQ. The MPDES Permit (No. MT-0030457 as modified on July 3, 2000) is effective until March 31, 2002. As modified, the permit allows discharge flow up to 1600 gpm into the Tongue River via any combination of 11 specific discharge points. The discharge flow limit is based upon gauging statistics from 1960 to 1994 and specifically is based upon a 7-day average low-flow rate expected every

ten years. If the field is discharging at its maximum rate and the river is at its 10-year low-flow rate, the resulting dilution factor will be approximately 12:1. The permit requires that the filtered, produced water be delivered to the discharge point by pipeline rather than a ditch, so that suspended sediment is not incorporated and does not impact the river.

Part of the produced water is currently delivered to several ponds constructed on the fee land leased by Fidelity Exploration & Production Company. These ponds are unlined and supply water to livestock as well as wildlife in the area.

CBM wells must pump water from the reservoir to lower pressure within the coal, to augment the formation of cleat, and to allow the natural gas to break out as a discrete phase. The amount of water that must be pumped off appears to vary not only from reservoir to reservoir, but also during the history of each individual producing well according to the specific coalbed reservoir it is producing from, and its proximity to other producing wells. Exhibit 6 presents a list of the average water production rates for approximately 200 wells in the CX field normalized to the age of each well (MBOGC oil and gas database). This data was compiled by averaging the water production rates from active CBM wells from the date of first production. For example, the average for month zero was determined by averaging the water production from all wells reporting for the first time that month, regardless of the calendar date production was initiated. A similar approach was used for each consecutive month. Results from this analysis show that water production rates declined steadily at the CX Field from approximately 12 gpm to slightly less than 8 gpm over a period of 20 months.

EXHIBIT 6 - AVERAGE PRODUCTION RATES IN THE CX FIELD, NORMALIZED TO AGE OF EACH WELL

Historical water production rates in the 200 CBM wells in the CX Field, Montana (MBOGC, April 2001).

AGE IN MONTHS SINCE FIRST PRODUCTION	AVERAGE WATER PRODUCTION (BWPD)	AVERAGE WATER PRODUCTION (GPM)
0	418	12.2
1	428	12.5
2	398	11.6
3	553	16.1
4	556	16.2
5	503	14.7
6	460	13.4
7	398	11.6
8	412	12.0
9	394	11.5
10	411	12.0
11	427	12.4
12	419	12.2
13	375	10.9
14	376	11.0
15	303	8.8
16	305	8.9
17	430	12.5
18	367	10.7
19	253	7.4
20	267	7.8

(Notes: gpm = gallons per minute, barrel = 42 gallons, BWPD = barrels of water per day)

The data provided in Exhibit 6 was used to perform a water production decline analysis. Appendix A contains a series of three (3) graphs along with data used to create each graph and to perform the subject analysis. The first graph developed utilizes the normalized average CBM water production rates from Exhibit 6. This graph also shows a superimposed exponential trend-line for the raw production data. The second graph shows the exponential decline rate projected forward for a period of 20 years following the initial CBM production. The third and final graph combines the water production data and decline analysis to show a semi-log plot of normalized average CBM water production rates combined with the long-term exponential decline of the data analyzed. The projected average water production rate over a 20-year period as determined from the exponential decline analysis is approximately 2.5 gpm. The actual average water production rates for individual CBM wells may vary from this average based on location, coal seam thickness, well completion type, coal reservoir properties, and other factors. This projected average production value represents a more realistic rate calculated from historical decline rates in CBM water production.